

CLAIMS

1. An electrostatic device configured and disposed to electrostatically charge and dispense a liquid composition from a supply to a point of dispense, wherein the device comprises:

an actuator;

a high voltage generator to provide a high voltage;

a power source to activate said actuator and said high voltage generator;

a reservoir to contain the supply of said liquid composition; and

a dispensing unit comprising:

a pump in immediate upstream relation with the reservoir for supplying the liquid composition from the reservoir, said pump being mechanically connected to said actuator to be driven thereby;

an emitter electrode to electrostatically charge the liquid composition, the emitter electrode being electrically connected to said high voltage generator; and

a nozzle to dispense the liquid composition, said nozzle being disposed at the point of dispense;

wherein the device further comprises a field electrode surrounding the reservoir, said field electrode being connected to said high voltage generator for providing the entire liquid composition with more or less a common electric potential; and

wherein the reservoir is configured to provide a removable cartridge, said reservoir being devoid of the field electrode.

2. The device as set forth in claim 1, wherein

said device includes a housing carrying said actuator, said high voltage generator, and said power source,
said housing being formed with a concavity for detachably receiving said reservoir,
said field electrode being incorporated in said housing around said concavity.

3. The device as set forth in claim 1, wherein
said housing incorporates a motor which drives said actuator for operating said pump;
said housing further incorporating therein a frame which mounts said motor as well as said high voltage generator,
said frame dividing the interior space of said housing into a front compartment and a rear compartment, said front compartment accommodating said motor and said high voltage generator, and said rear compartment defining said concavity for receiving said reservoir,
said housing comprising a front shell and a rear shell,
said front shell being fitted over said frame to define therebetween said front compartment,
said rear shell being fitted on said frame to define therebetween said rear compartment,
said field electrode composed of a first plate secured to the frame and a second plate secured on the interior surface of said rear shell.

4. The device as set forth in claim 2, wherein
said reservoir is coupled to said dispensing unit and is cooperative therewith to
define said cartridge,
said housing comprising a positioning means with which said cartridge
detachably engages for resting said reservoir in said concavity,
wherein when said cartridge is engaged with said housing, the actuator is
detachably engaged with a mechanism to activate said pump, and a voltage
terminal is detachably in contact with said emitter electrode to apply said high
voltage to said emitter electrode.

5. The device as set forth in claim 4, wherein
said positioning means is a mount formed at the upper end of said housing on
which said dispensing unit rests.

6. The device as set forth in claim 5, wherein
said voltage terminal is located below an opening which is formed in the mount to
permit the lower end of said emitter electrode to project through the opening for
contact with said voltage terminal when said dispensing unit rests on said mount.

7. The device as set forth in claim 1, wherein
said reservoir is deformable and made of a dielectric material.

8. The device as set forth in claim 1, wherein
said pump is a suction pump having a drive element which is driven by said
actuator to suck up said liquid composition from said reservoir and forces it out of
said nozzle.

9. The device as set forth in claim 2, wherein
said housing incorporates a motor which drives said actuator for operating said
pump;
said housing further incorporating therein a frame which mounts said motor as
well as said high voltage generator,
said frame dividing the interior space of said housing into a front compartment
and a rear compartment, said front compartment accommodating said motor and
said high voltage generator, and said rear compartment defining said concavity
for receiving said reservoir.

10. The device as set forth in claim 9, wherein
said housing has a vertical axis that defines an upper end and a lower end along
said vertical axis, and
said high voltage generator comprising a transformer which is arranged in stack
with said motor along said vertical axis within said front compartment.

11. The device as set forth in claim 10, wherein
said front compartment accommodates a battery energizing the motor, said
battery being arranged in a side-by-side relation with said motor in a direction
perpendicular to said vertical axis and arranged in stack with said transformer
along said vertical axis.

12. The device as set forth in claim 5, wherein
an inner cover is provided to be detachably placed over a top portion of said
housing,
said inner cover having an opening through which said nozzle extends and
defining around said opening a retainer which is placed against a portion of said
dispensing unit to hold it in position on said mount.

13. The device as set forth in claim 12, wherein
said housing is provided with a positioning means for engagement with said inner
cover to retain it on the housing.

14. The device as set forth in claim 12, wherein
said housing includes a front shell and a rear shell, in addition to said frame,
said frame carrying said motor, said transformer, and a battery energizing said
motor,
said front shell being fitted over said frame to define therebetween said front

compartment,
said rear shell being fitted on said frame to define therebetween said rear compartment,
said front shell being formed with a battery opening through which said battery is placed on said frame,
said inner cover shielding said battery opening when attached to said housing.

15. The device as set forth in claim 14, wherein
said housing is provided with a button for releasing said inner cover therefrom
and with a switch knob for actuating said pump,
an outer cover being provided to fit over said inner cover for concealing
therebehind said dispensing unit, said button, and said switch knob.

16. The device as set forth in claim 2, wherein
said field electrode is extended outwardly from said concavity to follow at least
part of the dispensing unit for covering a flow path of said liquid composition from
said reservoir to said nozzle.

17. The device as set forth in claim 4, wherein
said dispensing unit further comprises a field electrode.